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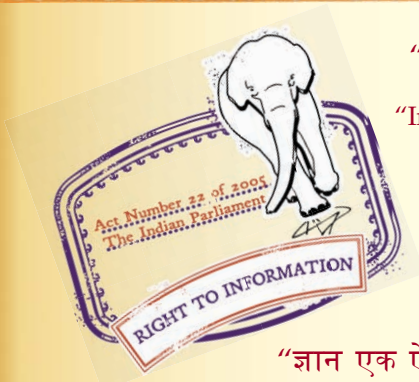
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“Knowledge is such a treasure which cannot be stolen”



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# *Indian Standard*

## SPECIFICATION FOR HALF ROUND MILD STEEL WIRE FOR THE MANUFACTURE OF SPLIT PINS

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## SPECIFICATION FOR HALF ROUND MILD STEEL WIRE FOR THE MANUFACTURE OF SPLIT PINS

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# *Indian Standard*

## SPECIFICATION FOR HALF ROUND MILD STEEL WIRE FOR THE MANUFACTURE OF SPLIT PINS

### 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 15 September 1977, after the draft finalized by the Wrought Steel Products Sectional Committee had been approved by the Structural and Metals Division Council.

**0.2** Round wire is rolled or drawn, or formed by a combination of both processes into a half round wire for fabrication into split pins.

**0.3** An annealing treatment is required either in the production of the round wire, or at an intermediate stage of the rolling or drawing of the round wire into the half round wire, so that the split pins may have suitable ductility. For the latter reason, the round wire may be supplied either directly drawn from the rod, or annealed in process, depending on the annealing facilities of the producer of the half round wire.

**0.4** The most important property of half round mild steel wire, as far as size and shape are concerned is that when doubled on its flat side, it slips easily through a round hole of the size for which it is intended.

**0.5** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS: 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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### 1. SCOPE

**1.1** This standard covers the requirements for half round mild steel wire for the manufacture of split pins.

### 2. TERMINOLOGY

**2.1** For the purpose of this standard, the definitions given in IS: 1956 (Part V)-1976† shall apply.

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\*Rules for rounding off numerical values (*revised*).

†Glossary of terms relating to iron and steel : Part V Bright steel bar and steel wire.

### 3. SUPPLY OF MATERIAL

**3.1** General requirements relating to the supply of mild steel wire shall be as laid down in IS : 1387-1967\*.

### 4. MANUFACTURE

**4.1** The wire shall be drawn from mild steel manufactured by open-hearth, electric, duplex, basic-oxygen or a combination of these processes. In case any other process is employed by the manufacturer, prior approval of the purchaser should be obtained.

### 5. CHEMICAL COMPOSITION

**5.1** The ladle analysis of wire when analysed in accordance with the relevant part of IS : 228† shall be as follows:

<i>Constituent</i>	<i>Percent</i>
Carbon, <i>Max</i>	0.10
Manganese	0.30 to 0.50
Sulphur, <i>Max</i>	0.04
Phosphorus, <i>Max</i>	0.04

**5.2 Product Analysis** — The permissible variation in case of product analysis from the limits specified in **5.1** shall be as given below:

<i>Constituent</i>	<i>Permissible Variation, Percent</i>
Carbon	+ 0.02
Manganese	± 0.03
Sulphur	+ 0.005
Phosphorus	+ 0.005

NOTE — Variations shall not be applicable both over and under the specified limits in several determinations in a heat.

### 6. SIZES

**6.1** The nominal sizes of these wires refer to the diameter of hole for which a given size of split pin is intended.

**6.2** Sizes and dimensions of half round mild steel wires shall be as given in Table 1.

\*General requirements for the supply of metallurgical materials (*first revision*).

†Methods of chemical analysis of steels (*second revision*) (being issued in parts).

TABLE 1 SIZES AND DIMENSIONS OF WIRES FOR SPLIT PINS

( Clause 6.2 )

( All dimensions in millimetres )

NOMINAL SIZE	WIDTH		THICKNESS		NOMINAL SIZE	WIDTH		THICKNESS	
	Max	Min	Max	Min		Max	Min	Max	Min
(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
0.6	0.5	0.4	0.25	0.20	4	3.7	3.5	1.85	1.75
0.8	0.7	0.6	0.35	0.30	5	4.6	4.4	2.30	2.20
1.0	0.9	0.8	0.45	0.40	6.3	5.9	5.7	2.95	2.85
1.2	1.0	0.9	0.50	0.45	8	7.5	7.3	3.75	3.65
1.6	1.4	1.3	0.70	0.65	10	9.5	9.3	4.75	4.65
2.0	1.8	1.7	0.90	0.85	13	12.4	12.1	6.20	6.05
2.5	2.3	2.1	1.15	1.05	16	15.4	15.1	7.70	7.55
3.2	2.9	2.7	1.45	1.35	20	19.3	19.0	9.65	9.50

## 7. TESTS

**7.1 Tensile Test** — The tensile properties of wire when tested in accordance with IS : 1521-1972\* shall conform to the requirements specified in Table 2.

TABLE 2 TENSILE PROPERTIES

NOMINAL SIZE	GAUGE LENGTH	TENSILE STRENGTH	ELONGATION
	mm	N/mm <sup>2</sup> , Max	PERCENT, Min
(1)	(2)	(3)	(4)
Up to 1.6	125	450	10
Over 1.6 up to 4	250	450	10
Over 4	8 times the nominal size	450	20

NOTE — 1N/mm<sup>2</sup> = 1MN/m<sup>2</sup> = 0.102 0 kgf/mm<sup>2</sup> = 1MPa.

**7.2 Wrapping Test** — Wire smaller than 5 mm diameter shall be subjected to wrapping test in accordance with IS : 1755-1961†. The wire shall withstand without breaking or splitting being wrapped eight times round its own diameter and subsequently straightened.

**7.3 Bend Test** — Wire of 5 mm diameter and over shall be subjected to this test. The wire shall withstand being bent through an angle of 180° round a former of diameter equal to the nominal diameter without showing cracks, breaks or splits.

\*Method for tensile testing of steel wire (first revision).

†Method for wrapping test of wire.

## **8. FINISH**

**8.1** The wire shall have one of the following finishes as specified by the purchaser:

- a) Annealed;
- b) Annealed, cleaned and limed; and
- c) Dull grey ( dry drawn ).

## **9. FREEDOM FROM DEFECTS**

**9.1** All finished wires shall be well and cleanly drawn to the dimensions specified. The wire shall be sound, free from splits, surface flaws, rough/jagged and imperfect edges, and other harmful surface defects.

## **10. PACKING**

**10.1** Each coil of wire shall be suitably bound and fastened correctly. If required by the purchaser, each coil shall be protected by suitable wrapping.

## **11. MARKING**

**11.1** Each coil of wire shall be legibly marked with the finish, size of the wire, lot number and trade-mark or the name of the manufacturer.

**11.1.1** The material may also be marked with the ISI Certification Mark.

NOTE — The use of ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

## **12. SAMPLING AND CRITERIA FOR CONFORMITY**

**12.1** The method of drawing representative samples of the material and the criteria for conformity shall be as prescribed in Appendix A.

**APPENDIX A**

( Clause 12.1 )

**SAMPLING AND CRITERIA FOR CONFORMITY****A-1. LOT**

**A-1.1** In any consignment, all the coils of wire of the same grade and diameter manufactured under essentially similar conditions of manufacture, shall be grouped together to constitute a lot.

**A-1.1.1** Samples shall be taken from each lot and tested for conformity to the standard.

**A-2. SAMPLING**

**A-2.1** The number of coils to be taken from a lot shall be according to col 1 and 2 of Table 3. These samples shall be taken at random by using number tables ( *see* IS : 4905-1968\* ).

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**TABLE 3 SCALE OF SAMPLING AND PERMISSIBLE NUMBER OF DEFECTIVES**

No. of Coils in a Lot	No. of Coils for Physical Requirements	Permissible No. of Defectives	No. of Tests for Chemical Requirements
(1)	(2)	(3)	(4)
Up to 25	8	0	2
26 „ 50	13	1	3
51 „ 150	20	2	5
151 „ 300	32	3	8
301 and above	50	5	8

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**A-3. PREPARATION OF SAMPLES AND NUMBER OF TESTS**

**A-3.1 Tests for Physical Requirements** — From the coils selected from col 1 and 2 of Table 3, adequate length of test piece shall be cut from each end and subjected to physical tests, namely, size, surface condition, tensile, bend and wrapping tests. A test piece failing to meet any one of the requirements, shall be called a defective. If the number of defectives found, is less than the number of permissible number of defectives specified in col 3 of Table 3, the lot shall be considered to have conformed to physical requirements otherwise not.

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\*Methods for random sampling.

**A-3.2 Tests for Chemical Requirements** — Unless otherwise agreed the following procedure shall be followed for chemical requirements:

From those test pieces which have conformed to physical requirements, further test pieces shall be selected at random according to col 4 of Table 3. These samples shall be tested for all the chemical requirements. If a test piece fails to meet the respective chemical requirement, it shall be called a defective. The lot shall be considered to have conformed to the chemical requirements if all the individual test pieces tested for chemical requirements pass the test, otherwise not.

#### **A-4. CRITERIA FOR CONFORMITY**

**A-4.1** A lot shall be considered to have conformed to the requirements of the specifications if **A-3.1** and **A-3.2** are satisfied.